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ABSTRACT

Presented are the proceedings of the Institute held to provide public day school personnel (teachers, administrators, and materials center personnel) with an opportunity to study methods of locating, acquiring, and utilizing materials for visually handicapped students. Recent research, new materials, and information from materials centers and commercial resources were reviewed. Papers and presentations included briefly review progress for the visually handicapped in Tennessee and describe the organization and services of the American Printing House for the Blind (Louisville, Kentucky), where the Institute was held. Other papers treat the use and coordination of services of instructional materials centers, current projects for development of materials (school readiness materials, and use of simple machines), three research projects at the American Printing House, reading and listening comprehension, and basic precepts in the teaching of the visually handicapped. (FO)

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1969 SPECIAL STUDY INSTITUTE FOR TENNESSEE EDUCATORS OF VISUALLY HANDICAPPED CHILDREN

BUFORD ELLINGTON, GOVERNOR • J. W. WARE, COMMISSIONER
SPONSORED BY TENNESSEE STATE DEPARTMENT OF EDUCATION

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SPECIAL STUDY INSTITUTE
TERMINATION EVALUATION OF VISUALLY HANDICAPPED PUPILS

April 21, 22 and 23, 1969
American Printing House for the Blind
Louisville, Kentucky

Conducted by the Tennessee State Department of Education
Under the Provisions of P. L. 89-926, as Amended

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FOREWORD

The Tennessee State Department of Education, Area of Special Education of the Division of Instruction, sponsored a special study institute for educators of visually handicapped pupils in public day schools. This institute was held April 21, 22 and 23, 1969, at the American Printing House for the Blind in Louisville, Kentucky, through funds made available by the U. S. Office of Education under the provisions of P. L. 89-926, as amended.

The institute was designed to provide public day school personnel (teachers, administrators and materials center personnel) an opportunity to investigate methods of locating, acquiring and utilizing all types of materials for visually handicapped pupils. A review of recent research and new materials, in addition to information from materials centers and commercial resources, should result in improved services to students. Also, such a review should provide new information which can be used to enhance students' communication skills.

We are pleased to bring these Proceedings to you, and we trust that the material presented herein will serve as a reference for those who participated in the institute and as a source of interest and information to those who may wish to improve or expand services to the visually handicapped.

J. H. Wolf

J. H. Wolf
Commissioner of Education

PREFACE

The American Printing House for the Blind is the world's largest producer of printed materials and other related educational aids for the blind. A research department is also in operation here. For these reasons, the Tennessee Department of Education selected this site for a Special Study Institute for educators of visually handicapped pupils. This Institute was held April 21, 22 and 23, 1969.

Mr. Carl Lagoda, Director, Instructional Materials Reference Center, American Printing House, and Mrs. Dolores Price, Supervisor, Area of Special Education, Tennessee Department of Education, welcomed the forty-one participants to the Printing House and to the Institute.

The Tennessee Department of Education expresses deep appreciation to Mr. Wade Davis, Vice-President and General Manager, and his entire staff for making available the facilities and resources of the Printing House. Appreciation is also expressed to superintendents of local school systems and their personnel for enthusiastic interest and support.

[redacted] OF INSTITUTE:

Dr. Vernon L. Johnson, Coordinator, Area of Special Education, Tennessee State Department of Education

[redacted] OF INSTITUTE AND EDITOR OF PROCEEDINGS:

Mrs. Dolores Price, Supervisor, Area of Special Education, Tennessee State Department of Education

PLANNING COMMITTEE:

Dr. Floyd G. Davis, Vice-President & General Manager, American Printing House
Dr. Carl Leggio, Director, DRMI, American Printing House
Mrs. Margaret Pearson, Supervisor, Area of Special Education, Tennessee State Department of Education
Mrs. Dolores Price, Supervisor, Area of Special Education, Tennessee State Department of Education

LAYOUTS:

Mrs. Dorothy Bryan, Assistant Editor & Field Representative, American Printing House
Dr. Emerson Foulke, Professor, University of Louisville
Dr. Randall Harley, Professor, George Peabody College for Teachers
Dr. Carson Nolan, Director, Educational Research, American Printing House

CONSULTANTS:

Mrs. Marjorie Allen, Instructional Materials Specialist, Regional Special Education Instructional Materials Center, Lexington, Kentucky

American Printing House Staff & Assistants:

Miss Annette Bettinger, Consultant, Development & Evaluation, DRMI
Mrs. Dorothy Bryan, Assistant Editor & Field Representative
Mr. Kendrick Coy, Model Maker
Mr. Frank Franke, Educational Research Intern
Miss Carolyn Halliday, Associate Material Development, DRMI
Mr. Robert Haynes, Data Processing Manager
Miss Marjorie Hooper, Editor
Miss Jane Kent, Office Manager
Mr. Carl Leggio, Director, DRMI
Mr. Ralph McCracken, Assistant Editor & Field Representative
Miss Hazel Moffat, Head of Magazines & Fund Raising Department
Mr. James Mosley, Chief Recording Engineer
Dr. Carson Nolan, Director, Educational Research
Mr. Floyd Oaks, Jr., DRMI Staff
Mr. Glenn Schmerich, Head, Textbook Department
Miss Nancy Steele, Educational Research Intern
Mr. Virgil Stobel, Plant Manager

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[illegible]

Status of Programs for Visually Handicapped in Tennessee

Delores Price

As a review of programs was made, it was found that at the present time Tennessee has seven school systems which employ full-time personnel who work with visually handicapped pupils. Six of these programs are located in the four major metropolitan areas. A total of twenty-two teachers work in these programs. This is an increase of ten positions over the rather constant number of twelve positions which has prevailed for several years. In addition to the teaching personnel, several persons are employed to aid in materials centers at the local level.

Ten of the twenty-two teachers hold a Bachelor's degree and two have a Master's degree. Fourteen are endorsed to teach visually handicapped, eight are working toward endorsement. Fourteen teachers have taught in regular elementary, junior and senior high classes with most of this experience being at the elementary level. Eight teachers have had experience only with visually handicapped children. It was interesting to note that twelve teachers have worked both with students who use Braille and those who use large print materials, while two have worked only with students who use large print. Years of teaching experience with the visually handicapped range from one year to a maximum of twenty-three years. Eight have taught visually handicapped pupils eleven years or more.

Two-hundred-seventy visually handicapped children received services during the 1968-69 school year. In January of 1969 a total of 181 children were registered with the Services Reading Room as being legally blind. All services were provided by an itinerant teacher or in a resource room. This is the first year that at least one full-time classroom has not been operated. This means that all visually handicapped students are spending some time each day in a regular classroom. Many visually handicapped children, in systems which have no special program, receive large print books and other aids for use in the regular classroom.

The task of providing adequate and appropriate educational materials for visually handicapped pupils is a major concern of educators. The needs of these pupils are highly individualized and very extensive. Until recently the sources of materials were very limited or nonexistent. Although there has been some increase in production of materials for visually handicapped, the needs continue to be great, and the task of selecting, acquiring and utilizing such materials continues to be a complex and constantly changing one.

This institute, which was planned to aid educators with the task of acquiring materials, is the first one to be held for all Tennessee educators involved in day school programs. It is, also, the first multi-state institute sponsored by the Tennessee Department of Education, and the first such statewide group to come to the Knoxville Fulton Bank. The information gained here should improve the quality of services and, hopefully, encourage expansion of programs for all visually handicapped pupils in Tennessee.

THE AMERICAN PRINTING HOUSE FOR THE BLIND

Dorothy Bryan

The American Printing House for the Blind, founded in 1858, is the oldest national agency for the blind, public or private, in the United States and the largest printing house for the blind in the world. It is the only independent agency devoted solely to the publication of literature for the blind and the development and manufacture of tangible aids for their use.

For 90 of the 111 years it has been the official schoolbook printery for the United States government through an annual grant from Congress for this purpose. During the first 20 years the Printing House supplied its materials on a cash basis through funds raised in the several states. By the time of the War Between the States, however, it became apparent that this could not work successfully and that there was need for a more permanent and adequate source of funds.

This need was discovered in 1853, as a matter of fact, when the American Instructors of the Blind, later the American Association of Instructors of the Blind and since 1968 the Association for the Education of the Visually Handicapped, held its first meeting. By 1870 they had prepared a "memorial" to Congress for an appropriation for the purpose of supplying books and instructional materials for the blind. As a result, on March 3, 1879 Congress passed an Act "To Promote the Education of the Blind." Interestingly enough the memorial became the preamble to the law.

Historically, the growth of the Printing House has reflected in almost direct proportion to the growth and expansion of all work for the blind. It has changed and expanded its services to meet the changing needs of educational and other services.

At the time that the Printing House was founded there were only residential schools for the education of blind children. The first day school program for such children was opened in 1900. Partially seeing children were not recognized as having special needs. If they could see enough to use regular print they were left in the regular school program to get along as best they could. If they had vision too low to manage this they were placed in a school for blind children and taught to read Braille. This meant, of course, that the Printing House prepared Braille textbooks and nothing in large type. It was not until the mid-forties of this century that it began producing large type textbooks for distribution. This, as you could know, came about due to the request of schools, who by then were needing them if they were to keep pace with the changing patterns of education of the visually handicapped.

In the early days there was no uniform Braille so the young Printing House had problems in production of materials for wide distribution. Its distribution problems have increased with the years even though a Standard English Braille was achieved. The present day concern is to produce a wide variety of texts in small quantities. Time was when the Printing House could offer texts to meet the needs of schools by making available a few good basic series for each subject area. When retrolental fibroplasia caused such an increase in blindness of children, however, changes in educational planning resulted in the opening of a tremendous number of day school programs. The great variety of textbooks used in day schools, to say nothing of the supplementary materials, means that the Printing House must produce any number of texts but in far smaller quantities.

As educators have refined their techniques and been more aware of meeting individual needs of children they have worked increasingly to help the child learn to use what vision he has. This means that many who in the past would have been taught to read Braille are now using talkprint of one sort or another. For this reason also, the Printing House now needs to supply more in large type than it did in the past. Annual registration of the children who fall within the definition of blindness now show that there are more print than Braille readers. This, of course, does not take into account all of those who are above the definition of blindness who need large type and for whom the schools must purchase books since the children are not eligible for registration with the Printing House for purposes of quota.

Certain very definite points were spelled out in the law and are still in effect. It is well for those people using the services of the Printing House to understand these since they answer many of the questions as to why the Printing House does and does not do certain things.

The law specifies that there must be annual registration of all children from kindergarten through 12th grade who are enrolled in public schools on the first Monday in January of the given year; that distribution of materials provided through Federal funds shall be determined on a per capita basis (This means that the number of children registered is divided into the annual appropriation to arrive at the per capita but does not mean that materials are to be allocated necessarily only to those children whose names appear on the register. By the time funds are available and materials produced some of those registered may have graduated, moved or even died). Also, no actual monies are distributed. Once the registration is completed and per capita determined, credit is set up on the books at the Printing House according to the number registered by each residential school, agency and state department qualified for such registration so that it may be drawn upon for obtaining books and materials. This is commonly referred to as "quota". The law also specifies that the Printing House is to produce those things not available on the commercial market for the education of the blind. In other words, the items must be "manufactured at" the Printing House. It does make it possible for the agency to adapt things on the commercial market when this makes them useful for the blind.

The law spelled out that the superintendent of each of the schools for the blind that was supported by public funds was to be an ex-officio trustee of the Board of the American Printing House for the Blind. Remember that the Printing House is a private non-profit agency and has had its own Board that from the beginning has been made up of prominent business and professional men from Louisville. The ex-officio trustees function only in that area of Printing House work that deals with the use of the appropriation from Federal funds. As time went on, registration was accepted also from agencies working with the adult blind that used public funds for an educational program below the college level. The head of each such agency also became an ex-officio trustee. Later still registration was extended to include children in organized classes in public day schools. At first there were few of these classes so registration was handled by each school system that had such services. There was no representation on the Board, however. It was not until there was such a great increase in the number of blind children due to retrolental fibroplasia that this situation changed. In a very short time many day school programs were opened across the nation and it was necessary to plan for their needs and arrange as simple a plan as possible for their registration. This was when the law was changed and each State Department of Education was asked to be responsible for the registration of children in day schools. Provision was made so that if a State Department wished it they could ask the residential school in the state to act for the State Department in registration but in the majority of states the Department of Education took on the responsibility. The Chief State School Officer or his designee then became an ex-officio trustee. Thus, the number of ex-officio members of the Board almost doubled.

The Printing House Board holds its formal annual meeting in October each year and it is at that time that the ex-officio trustees come together and through Board action the Printing House is directed to produce certain textbooks and other materials for the coming school year.

There are 3 committees (Publications, Tangible Apparatus and Research) composed of and chosen by the ex-officio trustees with membership on a rotating basis to insure continuity in their work. These meet just prior to the opening of the annual Board meeting and with due deliberation decide such things as which textbooks shall be produced for the next school year, what tangible aids will be needed, and the kinds of research that will be helpful. Often a part of their work has been carried on in correspondence prior to the meeting and, at times, they find it necessary to meet more than the one time a year. As said previously, action is taken on the committee recommendations at the formal meeting of the Board.

The ex-officio trustees are the spokesmen for the schools that they represent and are responsible for gathering information from the schools to use in their deliberations and decisions just as they are responsible for interpretation and transmission of information to the

schools from the Printing House. Among other things, they must process and sign all quota orders coming to the Printing House. These, of course, are some of the reasons that in many states the Chief State School Officer designates the person on his staff who is responsible for the program for visually handicapped children to be the ex-officio trustee and in the residential schools that have dual responsibility for the deaf and blind often the Principal of the School for the Blind is designated this responsibility.

While the law is stayed basically the same from the beginning, certain changes have been made in such things as funding. The appropriation is based on justification of need and no longer is a certain set amount year after year. Extension of registration beyond the residential schools has already been mentioned. The law specifies that Federal monies are to be used solely for the labor and manufacture, plus a small amount for overhead, in the production of books and tangible aids. Housing, storage, research, and numerous things are financed from private funds of the organization. Many people in education think of the Printing House only in terms of the work it does with these Federal funds. Actually this is a rather small portion of its work although it considers it an extremely important part. Few people read and study the law enough to realize that a great amount of its private funds are used in connection with supplying schools with the materials from the Federal funds. It was not until 1958 that legislation was passed to provide funds, separate and distinct from quota, to meet the cost of advisory and consultant services in connection with the administration of the Act. At this time a textbook consultant and two assistant editors were added to the Printing House staff. The assistant editors carry the title, Assistant Editor-Field Representative. Actually in the field and in a large portion of their work they are educational consultants. Part of their responsibility is to visit programs in the field in both residential and day schools, work with the State Department of Education, the superintendents of the residential schools, and visit the universities carrying on teacher education for the visually handicapped. It is important for them to stay current with practices and procedures in the field if the Printing House is to have information it needs to determine what it should produce for the schools. These two people, of necessity, must have a background and practical experience in the education of the visually handicapped so that they can interpret the needs of the schools. With the help of the people working in the field they must stay current with what is happening.

The Printing House considers that it has a responsibility for service to people in addition to its work as a publishing firm. It not only acts as a referral agency but offers many types of help to schools and individuals. For example, it recognizes that it will never be possible to produce all of the books needed by schools and individuals across the nation, that there is always going to be need for volunteers (as individuals and in organized groups) to supplement the books reproduced here. Realizing that there could well be much duplication of effort in

such work, the Printing House established a Central Catalog of Volunteer Produced Materials in Braille, Large Type and Recorded Form. This has resulted in a widespread exchange of materials and a greater variety of materials available to many children. The Central Catalog became a part of the Educational Materials Reference Center when it was initiated in 1966. The work of this largest department of the Printing House has added greatly to the services offered. Since Mr. Lappin will be talking with you about this no details will be given here.

In the work out concerned with federal funds for the education of children, the Printing House produces books and periodicals under contract for many agencies and organizations. This includes material in Braille and Talking Book form for the Library of Congress, for various religious denominations and groups, for private agencies, etc. It produces a great number of magazines in Braille and/or Talking Book form on a weekly, monthly or quarterly basis that include such magazines as THE READERS DIGEST, REDBOOK, and popular magazines as well as those of a technical nature of interest mainly to people in specific kinds of work. The Printing House raises funds for certain parts of its work such as the production and distribution without charge of the READERS DIGEST for the blind.

The improvement of materials, speed of production and, therefore, of delivery of items ordered and the increased number of tangible aids available are direct results of the continuous work in research and development. A part of this work, often forgotten in thinking of the production, is the development of machinery needed for production and not available from any source. You no doubt are aware of the fact that the Printing House and IBM worked cooperatively over a period of several years to make possible production of computerized Braille. Maybe you do not know that as a part of this the Printing House had to construct certain pieces of equipment and adapt others. Through the educational research carried on, the Printing House gains valuable information for planning and producing those items needed in the education of visually handicapped children. This has included information resulting from such studies as comprehension of rapid speech, listening skills, type size, roughness discrimination, and standardization of any symbols.

In the Talking Book Department recording is maintained at a high level of quality. Smaller discs that run for a greater length of time have replaced the old style ones, and research is continuous to improve all phases of the work. This year a new method is being tried out for reproduction of one to five copies of a book in large type. Limited orders are being accepted for this but it is recognized that much research and testing is still needed before we have a process that we feel is entirely satisfactory.

The professional staff at the Printing House has been chosen for competencies that enable each member to contribute to the over-all thinking and planning and give focus to phases of work needing

special attention. Since the inception of the Materials Reference Center and the expansion of the Research Department the size of the professional staff has increased. Also, through cooperative planning with one of the teacher education institutions some of the doctoral students are working at the Printing House. All of this is resulting in better meeting of needs in the field.

You, as educators, will want to know the ways that you can obtain the most prompt and efficient service from the Printing House. First, be sure that you have the latest set of catalogs and that your name is on the permanent mailing list so that you will automatically receive supplements and new catalogs as they are ready for distribution. Second, in ordering be sure to fill out the order correctly. Each category should be listed on a separate page marked at the top according to category, i.e., Braille, large type, tangible aids. Be sure that you use the correct catalog number to correspond with the item named. Each item listed in the catalogs has its own number that identifies it. A textbook in Braille will have one number and the same book in large type will have another number. Mixing the numbers will result in need for correspondence to clarify the order and cause delay in shipment. Third, read the catalog explanation so that you understand what the item or text really is. With a text check the copyright date, the edition that has been reproduced, the grade level, and other identifying information. Fourth, check as to whether or not the item is available on quota. For example, Perkins Braillers are available for schools but not to individuals on quota; Braille paper, bold line paper and Braillon is only available on quota when punched. This means that you must determine whether or not the order can be sent as a quota order or must be an accounts receivable one. If it is a quota order it must be on a form provided for this purpose and must go through the proper channels to your ex-officio trustee for his approval and signature before the Printing House can fill it.

You will want to understand, too, that once quota is assigned to the agencies registering children, the amount is set up on the Printing House books and then as orders are received and delivery made, the material becomes the property of the agency, residential school or State Department, as the case may be. For day school programs it means that those items ordered through quota belong to the State Department, not to the school that requested them. You need to know, too, that quota can be used at the discretion of the State Department and that the way this is handled varies from state to state. The present trend, however, is to establish a repository or materials center of some sort that can plan for more efficient use of materials on hand and avoid duplication of orders when items are already within the state and not in use.

Since the Printing House started working on a year-round production schedule in 1963 it has been able to guarantee delivery of texts and equipment by the fall opening of school if orders are received by the first of June each year. It recognizes that textbook adoptions are

and consecutive completed by June and that school people cannot always know by June what will be needed the following September. In such cases items that are known should be ordered and additional orders should be sent later. After June first, orders have to be taken on a "first come, first serve" basis.

The Printing House recognizes that this is a time of rapid change in philosophy, in products needed by schools, and in scientific and technological fields. It is an time to feel complacement, rather a time to stay abreast of what is taking place and use to advantage all things that will be of help to the blind. You people in the field can be of very real help in keeping the Printing House current with your needs. We not only ask but welcome your help.

DUTIES OF THE EDITORIAL DEPARTMENT

Ralph Holcombe

The editorial department, in addition to editing sub-grade material for Braille and large type, performs many functions which are not strictly editorial in nature. We receive and process all mail directing it to the proper departments. We also answer all of the general correspondence and much of the correspondence related to educational problems, Braille and large type format. We provide consultant services to schools for the blind, day school programs, teacher training programs and adult education centers. When visiting these programs, we explain and interpret the services of the American Printing House for the Blind. We compile all of the general sub-grade booklets distributed by APH. This includes the Annual Report, the Tour Guide, the History, Purposes and Policies, etc.

We supervise the stereograph and proofreading departments and get all books ready for both stereograph and IBM. Preparing a book for either of these departments involves estimating both the number of Braille pages and the approximate cost of the finished book. It also entails writing out directions for the stereograph or keypunch operators and making catalog cards, not to mention editing the material for Braille. Then, too, we edit, write directions and make catalog cards for all material that goes into large type. The department estimates the number of books required for the coming school year and is responsible for making work orders and printing orders to insure that the books will be ready for delivery on time. We catalog all publications for press Braille, thermoform Braille, Braille music, large type, talking books, educational tapes, and supervise the production and mailing of all catalogs and supplements. The production and distribution of the tangible apparatus catalog is also our responsibility.

Each November, we send out the materials for registration for the Federal Quota and early in January begin checking the registrations of each child to see that he qualifies. After the registrations are checked, they are returned to the ex-officio trustee for certification and signature. The editorial department also handles special orders for individuals and organizations such as the Library of Congress (our biggest Braille customer), the Posts System, American Bible Society and various church organizations.

We have recently gone into thermoforming on a large scale and have accepted a great number of Braille masters from IBM, Detroit Public Schools and Cincinnati Public Schools. There are plans to receive masters from other sources, also. This will enable us to perform an additional service to blind children. I hope this gives you a general idea of the scope of our work.

DUTIES AND RESPONSIBILITIES OF THE PLANT MANAGER

Virgil E. Siebel

The Plant Manager is responsible for the production of Braille books, magazines and pamphlets; the production of large type texts, starting with the edited copy through platemaking, printing and binding; the production of many items of Tangible Apparatus---- maps, globes, Braillewriters, slates and other similar items. This does not include talking book machines, tape recorders and Portable Cane Locators; these items, being electronic, are produced in the Recording Department. It is important to point out that the production of Tangible Apparatus requires a product planning or development stage where the choice of materials and processes is made.

The letterpress printing department where title pages for Braille books, library cards, talking book labels, alphabet cards, letterheads and various other in-plant items are printed is also under the direction of the Plant Manager. He is responsible for the design, building and maintenance of the various special machines used in production----stereograph machines, Braille printing presses and special binding equipment. Talking book shipping containers are also produced under his direction.

The specification, ordering and inventory of all materials used in the above departments are the Plant Manager's responsibility.

EDITOR'S NOTE: Following Mr. Siebel's report, a two-hour tour of the Printing House was conducted. This was followed by a question and answer period. According to many participants, these two activities were the highlights of the program. Many participants returned for a second visit to areas of particular interest. The handout materials, which included bibliographies, pamphlets and catalogs, were greatly appreciated. These are available to anyone upon request.

THE TALKING BOOK PROGRAM

Glenn Untermeyer

The Talking Book Department here at the Printing House was originally set up to help provide a manufacturing source of records for the Division for the Blind of the Library of Congress. The Talking Book Program has grown rapidly and now includes a wide variety of recorded materials. The Printing House supplies approximately one-half of the recorded titles made available under the program of the Library of Congress. This program includes books of fiction and non-fiction and, also, many popular magazines.

The Printing House publishes two talking magazines on its own; "The Braille Digest" and "Newsreel"; over 6,000 "Digest" copies each month, and 7,000 "Newsreel" copies each week. The department also undertakes, on a contract basis, the manufacture of many other talking books and magazines published by independent organizations. We have recently started recording "Junior" and "Junior Scholastic". Our facilities include an editorial department, recording studios, "talking" or mastering rooms, electroplating shop, record pressing plant and plastic molding equipment.

The Talking Book Department has tape duplicating facilities capable of turning out large numbers of copies of tapes. We have a catalog of recorded educational tapes including many different subjects, such as; music, language, social studies, literature and science which are intended for use in the school room as supplementary material. We also do contract tape duplication for the Library of Congress and other agencies for the blind. The department has an "Electronic Assembly" section which modifies and manufactures tape recorders, phonographs, and other electronic devices.

A continuing program of research and development goes on within the department. Suggestions from the Division for the Blind and from our educational research people are carefully explored.

Over the years, many improvements in recording and manufacturing of records have been made. Some of the innovations have become standard procedure in the cost of the recording industry. The cost of all talking book records has been greatly reduced by changes in process, materials resulting in a great increase in literature available to the blind. Most recently, an 8 1/3 rpm record was developed and is now in use in the Talking Book Program. These records play for approximately 2 1/2 hours per side.

We are presently at work with the Educational Research Department on the design of special equipment and recorded materials for textbooks.

We are now supplying a specially modified tape recorder, the Sony Model 105, which incorporates our audible tone indexing system. This system allows the blind student to record a subsonic tone at any point in a recording which he wishes to find later. When, in reviewing the recorded material, he plays the tape at fast forward or rewind the subsonic tone is heard as a loud "beep", easily identifying the "marked" spot on the tape.

The Talking Book Department provides general maintenance of buildings and grounds and supplies all utilities to other departments.

New "Solid State" Variable Speed Control

We have one additional new product here at APH. This is a new "solid state" variable speed control developed by Mr. Bob Phelps of our recording department. This unit is to be used in conjunction with cassette tape or record playback equipment. This speed control will permit the blind student to play tapes or records at any speed he might wish. The tape or record may be played faster or slower than it was originally recorded. Thus, the student can have the recorded information at his own rate of comprehension. The ability to slow the recorded material might also lend itself to making Braille notes more easily.

The new speed control operates on a principle whereby the frequency of the electricity supplied to the motor is varied, thus the motor, which is of the line frequency established type, changes speed without loss of power or speed stability.

The speed control, although designed for the Sony Tape Recorder, will also be offered installed in one model of the new APH talking book reproducer.

The Sony 105 tape recorder, specially modified for the blind, will offer this speed control installed within the existing cabinet. This recorder will also have the APH tone indexing system.

New APH Talking Book Reproducer

A talking book reproducer of totally new design will be ready soon. It will be small in size and incorporate many new features which should make it very easy to use. The case is of well-styled luggage type of very sturdy construction with heavy metal fittings and trim. The pickup arm is of totally new design engineered in the laboratories of the E. F. Andrews Foundation. This pickup arm provides location of the start of any size phonograph record and completely protects the record from accidental damage or scratches from the needle while playing. The needle tracking weight is only three grams, thus the pickup is simply too light to damage the grooves of the record in any way.

The amplifier is of the latest solid-state design, incorporating an integrated circuit providing an output power of ten watts which is more than adequate to play the new 8 1/3 rpm records. This amplifier is much more dependable than the old tube type and should withstand many rough handling.

The speaker is of a new compact pair-fane type that requires only a small cabinet baffle to produce a good sound. The use of this type speaker contributed greatly to the compactness of the new reproducer.

The reproducer will be offered with or without the new electronic speed control.

Textbook Indexing

By utilizing the electronic phonograph system developed by the Electronic Corporation, it is possible to record two different sound signals in the same grooves on a phonograph record. However, the system does not provide complete separation of the two signals. The record industry is satisfied with the system as it stands since total separation is not needed for the reproduction of stereo music. Two years ago, we made a test of a reading study from a master tape having two separate tracks, with the voice of one talking back reader recorded on each track. The results of this early experiment were favorable, and we have now acquired the necessary equipment to produce these records. Although we have had our equipment only a short time, we have produced an experimental talking book textbook record which we will play for you today.

A special phonograph has been constructed, using some of the components from the new RPR reproducer. The purpose of this design being only to demonstrate some of the features of a two-track recorded textbook disk and to help point out the feasibility and possible technical limits of the system.

This reproducer has a conventional stereophonic pickup arm and a specially modified phonograph turntable. A selector switch allows the user to play the record at 8 1/3 rpm or at even speed of 66 2/3 rpm. The same switch also provides bracking and reverse.

The special textbook record contains the subject matter of the book on one track, recorded at 8 1/3 rpm with indexing information at a speed of 66 2/3 rpm on the other track. By manipulation of the selector control, the user may have such information as table-of-contents page numbers, recorded at the high speed and then upon reaching that desired page, play the record instantly and then hear the short

tab-point page wanted, played at 8 1/3 rpm. If the proper place on the record is passed by, the user may reverse the turntable and scan back at high speed to the correct page.

I would like to demonstrate a record for you now which, I think, will give you some idea of what we intend to produce at the conclusion of this research. I do want to stress that this demonstration only indicates what can be done and is, by no means, a finished design.

REGIONAL SPECIAL EDUCATION INSTRUCTIONAL MATERIALS CENTER, LEXINGTON, KENTUCKY

Marjorie Allen

The University of Kentucky Regional Special Education Instructional Materials Center was established in June, 1966, to provide information about instructional materials to persons in Kentucky, Tennessee, North Carolina, and West Virginia who work with exceptional children and adults. It is one of nineteen such regional centers in the United States that comprise the Instructional Materials Center Network for Handicapped Children and Youth.

In order to make REIMC services more directly available to special education personnel, Affiliated Centers are being developed throughout the region. Professionals in the area served by an Affiliated Center receive direct services from that facility. If an instructional material is not available at the Affiliated Center, personnel at that Center can arrange to borrow the item from the UKREIMC. Those who are not served by an Affiliated Center are eligible for direct service from the Regional Center at the University of Kentucky. The services that are available are specified below.

The UKREIMC Library serves as a depository for instructional materials in special education. Teachers throughout the region may borrow these materials through their Affiliated Center or from the Regional Center as specified in the previous section. (A library card application is attached for your convenience.) Items may be either checked out in person or may be borrowed by submitting a telephoned or mailed request. In the latter case, the client will be responsible for return postage on any item that is borrowed. This gives the teacher an opportunity to examine various materials in detail in order to determine whether they would be appropriate. Note that the materials are available on a loan basis only. For information related to library services and holdings, contact the Document Specialist.

Members of the Center Staff are available to give demonstrations of materials to teachers at conferences, regional meetings, in-service training sessions, and at the Center itself. At least two formal institutes are offered each year and other workshops can be arranged upon request. To arrange for workshops or demonstrations, contact the Field Services Coordinator.

Clients of the Center receive the UKREIMC Quarterly, a free newsletter that contains information specifically related to instructional methods and materials. Selected annotated bibliographies are also available.

Personnel in the IMC Network cooperate with personnel at the Council for Exceptional Children Information Center in the preparation of the national journal, Teaching Exceptional Children. This is a quarterly journal devoted to practical consideration for teaching exceptional children. Included in the journal are articles which discuss such things as: (a) instructional methods and materials, (b) educational diagnostic techniques, (c) evaluation of materials, (d) research implications for teaching, (e) teacher ideas, and (f) selected references for classroom teaching. To subscribe to this publication, send five dollars to the Council for Exceptional Children, Box 6034 MidCity Station, Washington, D. C. 20005.

Staff members of the UKRSEIMC are available for consultation regarding instructional materials. For example, if a teacher has a specific problem, lists of appropriate materials will be made available with suggestions as to which of these might be most useful for that particular situation. In addition, staff members are available for consultation with school personnel who are interested in establishing materials libraries in their institutions. Contact the Instructional Materials Specialist to arrange for consultations.

Personnel at the University of Kentucky Regional Center work closely with others in the Instructional Materials Center Network for Handicapped Children and Youth in the development of new instructional materials. Information pertaining to these developments will be made available to clients through the UKRSEIMC Quarterly.

Research programs for the evaluation of materials are in progress. Panels of master teachers also evaluate various materials. In addition, controlled studies are performed to test different instructional techniques. Interested teachers are encouraged to participate in these research activities. Inquiries concerning evaluations should be addressed to the Research and Development Coordinator.

THE AMERICAN PRINTING HOUSE INSTRUCTIONAL MATERIALS REFERENCE CENTER FOR VISUALLY HANDICAPPED

Carl Lappin

The Instructional Materials Reference Center here at the American Printing House offers consultive services and serves as a national clearing house for educational materials for visually handicapped only. This single emphasis of our Center is quite different to the one at Lexington which is a Center for all areas of special education. Our activities revolve around the following objectives:

1. To establish and maintain a central catalogue of information about curricular and instructional materials for visually handicapped children.
2. To supply, upon request, lists and descriptions of materials together with information concerning their sources and costs.
3. To discover, describe and evaluate materials already developed for use in education of visually handicapped children.
4. To develop new materials or adapt already available materials and evaluate their usefulness.
5. To develop manuals or sets of instruction describing how the special materials for visually handicapped children should be used.
6. To provide a steady flow of information concerning available materials to the field.
7. To provide exhibits, lectures and demonstrations on educational materials to professional meetings, teacher training programs and school systems.

It is our purpose to serve as an information source concerning available materials and as a development and evaluation facility for materials that are desirable but presently unavailable.

Direct your requests about instructional materials to us. We will use every means at our disposal to search out information for you.

Let us know of your locally developed materials. Together, we can develop user manuals, evaluate the practical utility, and publicize those materials which would be appropriate beyond the local level.

Many of you have prepared Curriculum Guides and/or Courses of Study which contain many helpful teaching techniques for specific use with the visually handicapped. We are often asked for such resources in all subject areas. We would be happy to receive two copies of those Guides which you have found to be of value. If you will advise us of availability and cost, purchases will be made.

The function of the [illegible] Model Shop is to create functional models of items which development personnel find to be needed.

Once the need is established the Model Shop experiments with various ideas and materials to create a working model. This model is worked with, tested, criticized and remade as many as five or ten times before the prototype is accepted. Five of these prototypes are then made for field testing.

During this test period, various modifications are made to improve the item. After all the modifications are made, which use in the field have shown to be needed, the final prototype is then submitted to the production department for manufacture.

Central Catalog

In your packet of materials you will find a booklet which discusses, in detail, the purpose and possible services of the Central Catalog. As most of you may know, the catalog is a card-file index of volunteer-produced textbooks and children's literature which is maintained as a valuable source of information for teachers, administrators, librarians, students and all persons who work with visually handicapped individuals. The listing includes materials in Braille, large type, disc or tape recorded from which is reported to us. The catalog is no more than a reporting service and its usefulness depends entirely on the extent of cooperation from all sources.

The proper use of this service can be of great benefit to all visually handicapped persons. I recommend that you study the booklet carefully and avail yourselves of its services.

READINESS MATERIALS FOR THE PRESCHOOL VISUALLY IMPAIRED CHILD

Carol Halliday

In the fall of 1968, the Instructional Materials Reference Center (IMRC) at the American Printing House for the Blind (APH) began a program aimed at the preschool child who is visually impaired. Prior to this time, pockets of action in this area were apparent around the country. Organizations such as the American Foundation for the Blind, American Association of Instructors of the Blind (now the Association for the Education for the Visually Handicapped) and the Delta Gamma Foundation were showing concern in various ways. Through their efforts, books and pamphlets on this subject were being made available, interested persons were convened to discuss and confer, counseling services were offered to parents of young children, and active interest in preschoolers was encouraged among other persons and programs.

The concern of the Printing House, with regard to children, has always been the meeting of the needs of the school-age child. With the exception of several materials appropriate to children at the level of "reading readiness", there has been nothing for the preschooler through the APH program and very little for the primary youngster. Rapidly increasing understanding of the importance of the preschool years and the realization of their particular crucialness where children with special problems are concerned have caused a reassessment of need. In September, 1968, an IMRC staff member was assigned full time to the project, "educational materials for preschool visually impaired children", and a program in this area was thus begun.

It was decided through the coordinated thinking of the IMRC and the Department of Educational Research of the Printing House that a review of pertinent literature would be of first importance. Several months were spent in the perusal of materials relative to: children generally (from birth to roughly six years); visually impaired children, especially; how children learn and intelligence. (At least for the moment, we are defining this youngster as the child whose vision is such that his clearest information and understandings about the world around him come by other than visual means.) Based on this (continuing) review, a bibliography will be compiled and used in diverse ways. Concurrently with the literature review, letters were written all over the country--and to several other countries as well--to persons and organizations which we felt would be interested in our efforts and would perhaps make some contribution to them. Visits were made to different kinds of children's programs; among which were those serving "normal" children, perceptually handicapped children, those culturally disadvantaged, and those visually impaired.

It was felt that a brochure for parents was an important need. A number of rough drafts have been completed and still another re-writing is soon to begin, which will reflect the comments and suggestions of selected readers. The focus of the booklet has changed, however, since its inception, as has its size. It now is felt that the most effective tool which we could offer would be that geared to the professional persons, who may or may not be trained in visual impairment. These people (in child development, child welfare, medicine, education, etc.) with a certain body of knowledge and understanding already there by virtue of their backgrounds, can use such a booklet with parents of visually impaired children--with whose families they may already be in touch for any of numerous reasons. This will make possible a more "total family" approach and will hopefully aid local communities in beginning early to be actively concerned with the needs of all their children. When the booklet is completed, notice of its availability will be sent to certain key persons and organizations throughout the country.

One phase of the review of literature was looking at the sequence of toys, play things, educational materials which encourage and enable the child's progressive learning and development. Their theoretical aspects were probed, and specific examples were searched for in various manufacturers' catalogues and pertinent literature. Though many existing materials are already available, with modifications for the young visually impaired child, certain lacks presented themselves.

As a result of this aspect of our concern, it was decided to call together a small group of knowledgeable people at the Printing House for a "working conference". These people, supplied in advance with parent booklet and a tentative list of materials needs, were asked to constructively criticize priorities and details, where possible. At a three-day meeting in mid-March, the group convened. It included: Barbara Barraga, teacher of emotionally disturbed children in Atlanta and co-author of Teaching Aids for Blind and Visually Limited Children; Kay Burton, Chief, Language Development Program, Bill Wilkerson Hearing and Speech Center in Nashville; Ina Barnstable, Curriculum Director, Utah School for the Blind; Bob Olen, Director, Program for Multiple Handicapped Children, Texas School for the Blind. Two members of the PHH staff participated, as well.

The tasks were done, as defined, with consideration of materials needs geared to the older preschool child. (Correspondence with Selma Fraiberg of the Children's Psychiatric Hospital, University of Michigan, Ann Arbor, had acquainted us with the educational program for blind infants there, a part of whose concern is toys. It seemed most appropriate, therefore, for us to aim our efforts roughly from the three-year-old level up to the point of "ready to learn to read"). The areas of critical need, based on the skills and understandings essential to visually impaired children and often lacking--sometimes to devastating proportions, were spelled out with particular regard to: auditory and visual training, increasingly refined hand use and self-care.

These groups of priority needs were determined and from there the following materials have already been prototyped:

1. A set of 36 textured blocks (12 each of 1 inch, 1-1/2 inch, 2 inch dimensions), varied in a number of ways;

2. A tray to be used as a work space for varied purposes;

3. A small constructo set (similar to that already produced by AFB, but containing only one-fourth the items in the large set);

4. A greatly enlarged button/buttonhole and belt/buckle for the teaching of the beginning understanding of what is involved in these tasks;

5. A set of two wound cylinders with handles ("Materas") whose tops screw on, and whose contents can be infinitely varied;

6. A "peg wagon" with slide-in "beds"--which would allow the young child to push and pull it, then would permit taking out and putting in items first (just as any wagon would), then would be usable as a gross peg board on wheels (the two beds have places for three large pegs and for six);

7. A take-apart doll to be used as a kind of puzzle having to do, as well, with improved understanding of body parts;

8. A pair of hands (wood) in a wooden formboard, useful in developing the understanding of left and right, and as a lead-up to the textured hands in Touch and Tell (already available at the Printing House);

9. Large tactually-interesting beads.

Two additional items have been prototyped--several small "geometric puzzle" sets which consist of individual form boards (4 inches by 5 inches) for each shape, and the possibility of filling each form with groups of two or three pieces; a "shape board" on whose permanent pegs (five rows of three across) small geometric shapes can be hung for purposes of discriminating, counting, etc.

Presentations have been made on several occasions concerning these prototypes and construction criticisms are being gathered and carefully considered. Field testing will begin soon--the goal, the development of educational materials especially suited for visually impaired children, which will be multi-purposed, will encourage perceptual and conceptual as well as fine muscle learning.

and will be economically feasible. (It should be here noted, that such materials will be of value to children generally, as well as to children with other kinds of problems besides visual ones.) As it is judged that such a material, defined above, has been attained, it will be produced by the American Printing House for the Blind and its availability announced. A descriptive piece of literature (i.e. a leaflet) will be written for each material, discussing its purpose, how it might be used, the child's functioning level for which it is most suited, how to encourage the user's creative use of the material, etc.

We would welcome comments and suggestions from our readers concerning the newly begun IMRC/APH program for the young visually impaired child. They should be written in some detail and should be addressed to the IMRC at the American Printing House for the Blind, with reference made to the "young visually impaired child project."

[illegible]

Abstract Retrieved

A study undertaken, to determine some specific needs for supplementary materials in the field of science, is nearing completion.

A previous survey completed here at the American Printing House pointed up the need for the development of instructional aids to better present concepts about simple machines to visually handicapped.

These specific needs were identified through analyses of science textbooks used in grades one through twelve. Braille and tangible editions were reviewed for the purpose of identifying the concepts suggested by the subject content and for the purpose of identifying the methods which are used to present these concepts to the student.

The study revealed that many pictures in the tangible editions are included for interest, attentiveness, and motivation. Other pictures and diagrams included are essential to the problem at hand.

In the Braille editions, pictures and diagrams are limited to those which are essential to the learning problem and may be reproduced under present manufacturing methods. As you know, there is yet to be found a technique that can meaningfully reproduce 3-dimensional drawings. As a consequence, many pictures and diagrams have been omitted. Instructional aids could fill in some of these gaps.

Many activities recommended and instructional aids used are predominately sight-oriented. The visually handicapped student may meaningfully perform experiments and use the provided aids only to the extent that a teacher or classmate help him interpret what is happening.

The lack of measuring tools is particularly depriving, for he, the student, is dependent upon the sighted to provide him with data which must be gathered through the medium of measurement.

Concurrent with this study has been the development of measuring devices that can be used by the Braille reader. Three of these devices, a gas balance, a spring balance, and a Metric-English ruler, have been incorporated into the experiments which are using measuring techniques to develop concepts about simple machines.

Much of scientific knowledge is gained through experimentation. With this philosophy as a guideline a teaching manual has been developed. Guidance from the teacher is essential, but much independent work may be participated in by the student.

One example, of many concepts and/or generalizations which are presented in the manual, is:

> Less effort is needed to raise an object by using a movable pulley than by using a fixed pulley.
>
> The student uses the fixed pulley and threads the cable; attaches a given weight to the cable; attaches the spring balance and finds out how much effort it takes to lift the weight. He then uses the movable pulley and threads the cable; attaches the same weight to the movable pulley; attaches the spring balance and finds out how much effort it now takes to lift the weight.

The above method is most effective, particularly if the student questions the authority of the statement.

The manual is full of experiments that demonstrate the usefulness of simple machines. The student himself is given opportunity to test out concepts. He can, perhaps, gain a better understanding of force, friction, work and mechanical advantage.

REPORT OF THREE RESEARCH PROJECTS
AT AMERICAN PRINTING HOUSE

by. Carson T. Dolan

A. Use of Curriculum Analysis in the Development of Educational Materials for Visually Handicapped Children

Curriculum analysis has been used successfully to systematically discover curriculum deficits for visually handicapped children and to provide materials and aids to help overcome these deficits.

Analyses of textbooks and instructional materials used by sighted children and Brailled and large print materials used by visually handicapped children were made to discover:

(1) General curriculum areas where deficits for visually handicapped occur.
(2) Specific content units in each area.
(3) Concepts presented and developed in each unit.
(4) Specific materials and aids used to present these concepts.

Relying on the information acquired from this analysis, specific needs are identified, goals are set and a project is proposed. Current research studies and literature are reviewed.

Educational aids and materials which reach production stage result from:

(1) Examination of catalogs from specialized producers of aids for visually handicapped to determine if such aids are already developed.
(2) Examination of catalogs and brochures from commercial sources for sighted to determine if existing aids and materials can be utilized.
(3) Adaptation of commercially available aids where possible.
(4) Development of new aids and materials when necessary.
(5) Implementation of relevant research findings in the adaptation and development of aids, where feasible.
(6) Preparation of manuals and/or instruction sheets for use with aids and materials.
(7) Field testing of aids and materials with appropriate blind and partially sighted children.

Projects for development of educational aids which have relied on curriculum analysis are in various stages of completion in three areas--science, mathematics and social studies.

Measurement in Science: Basic measurement in science concepts were examined and the instruments used to illustrate them were identified. These instruments--the ruler, the spring balance, pan balance, and the thermometer--were adapted and/or developed. Relevant research provided guidelines for constructing tactile forms of the instruments. Seventy subjects, 31 junior high and 39 elementary school Braille students were used in field testing the kit. The kit has been approved and production is underway.

Simple Machines: Such simple machines as the lever, wheel and axle, inclined plane, pulleys, screw jack, screw cylinder, nut and bolt, used to present basic concepts of mechanical advantage, force and resistance were identified. Prototypes of these machines were constructed and adapted for use by blind children. Field testing in two residential schools and in one public school program has been completed, and the machines are nearing readiness for production.

Volume Block Set: A set of blocks consisting of ten combinations which can be assembled to form various geometric designs has been developed and field tested. The blocks are designed to enable the blind student to acquire tactually concepts of measurement of surface area and volume of geometric solids illustrated in tactile textbooks. This set is in production.

Map Reading Exploration: Using curriculum analysis the basic geographical terms used in fourth, fifth, and sixth grade social studies textbooks were identified. Students were tested to evaluate their ability to define these terms. A number of the concepts represented by these terms were found to be relatively unknown at several grade levels. While no materials have been developed as yet, implications are for the development of materials to teach basic geographical concepts to blind children prerequisite to map reading instruction.

Employment of curriculum analysis in the development of educational materials can provide an organized and systematic approach to identifying not only tactile aids needed by visually handicapped students, but also concepts that these aids illustrate or explain. The aids developed can be programmed to teach these concepts. Consequently, materials developed have utility for use by all visually handicapped students in a particular area, such as science, since aids and materials are based on concepts generally and not on a particular science textbook. This approach should be equally effective in the development of educational aids and materials in other areas of exceptionality.

B. Reading and Listening in Learning by the Blind

At midyear, we received substantial support from the U. S. Office of Education for a four-year program of research and development in this area. Not only did this award provide for further comparative studies of listening and reading in learning, but also provided support for the

development of a comprehensive system for study using recorded media. Work on the project undertaken during this year included the following:

(1) Task Analysis of Study Through Listening: In order to design an aural study system, a thorough understanding of the tasks involved in study through listening is necessary. To gain this knowledge, an analysis was made of the processes involved in studying from recorded textbooks. The books used were three previously recorded at APH in the Talking Book program and the equipment used was an APH reproducer. The analysis resulted in identification of 15 distinct tasks involved in study from records. The steps necessary to complete each task were described in detail by identifying each necessary response, sequentially, along with the cue initiating it. This information was then used to help generate a tentative set of specifications for the design of play back equipment to be used in a study system.

(2) Design of Play Back Equipment: Specifications for this equipment include those for physical size and for operation. From the physical standpoint, the equipment should be portable - small and lightweight. In terms of operating characteristics, it should have instantaneous stop-start, forward-backward movement, variable speed, remote controls for stop-start and forward-reverse, detent tone-arm positioning, and multitrack operation. During this year an extensive study of electronic and other components for use in the play back equipment has been undertaken. A variety of AC and DC motors, speakers, tone arms, miniturized amplifiers, controls, and other components have been found or developed and evaluated. This work, of course, is being conducted for us by the Recording Department.

(3) Application of Stereophonic Recording Techniques to Recording Indexing: Place finding with recorded material is a task involving many difficulties. Analysis of this task indicates that supplying indexing data in a readily accessible parallel recording may help solve this problem. Application of stereophonic recording techniques where two tracks are recorded in one groove of the disc that can be played independently have been previously explored for this purpose. Preliminary steps for further research and development in this area were completed during the year. Under our OE grant, the APH Recording Department obtained a Westrex 3-D Stereodisc Transfer Recording Channel and an additional Scully Automatic Disc Recording Lathe which have now been installed and calibrated.

C. Research in Braille Reading

A monograph describing the results of our long term research project on perception in Braille word recognition has been completed and is currently in the hands of the publishers. One important outcome of this was the development of a theory of perception in Braille reading. This theory holds that Braille word recognition, unlike its

counterpoint in print reading, is a sequential integrative process in which word recognition is the result of accumulation of pieces of information over a temporal interval. The perceptual unit in Braille reading is not the whole word shape, but the Braille character. Skilled Braille reading appears to be based on a probabilistic model of the Braille reading environment. The complexity of the model developed is directly related to the mental ability of the reader. A number of perceptual cues are used to identify correctly words before all their individual characters are sensed. Among these are expectancies for the relative frequency of letters in print, experience with the relative probabilities for letters following one another, experience with the occurrence of sets of letters, experience with the grammatical structure of the language, and cues stemming from preceding context. This theory demands a decoding approach to teaching reading which is directly in contrast to the whole word and/or whole sentence approach to teaching Braille reading that has been adopted by about two-thirds of the teachers of blind children in the United States today.

Starting next year, plans have been made to explore approaches to implementing our theory through design and trial use of special teaching materials and special teaching techniques.

A COMPARISON OF READING AND LISTENING COMPREHENSION OF BLIND CHILDREN WITH IQ's BELOW 85

Nancy Steele

This is a report of the doctoral research done by Mrs. Steele of Peabody College while a Research Intern at the American Printing House for the Blind. Mrs. Steele taught partially seeing children in Davidson County, Tennessee, before entering the doctoral program at Peabody.

Introduction: Blind children who use Braille as their educational media read at extremely slow speeds. Research finding indicate these average between 60 and 90 words per minute (wpm). These rates are considerably slower than those for sighted, print readers and represent a much slower rate than normal speech, which is about 170 wpm. The blind child with a low IQ reads at an even slower rate which has a striking effect upon the amount of material to which he is exposed within the course of reading educational materials. The purpose of this study was to demonstrate the superior efficiency of material presented auditorily (amount learned in time spent) and at least equal effectiveness (amount learned) through use of the auditory mode.

Children between the ages of 9 and 21, attending five residential schools for the blind whose IQ's were below 85, were given a portion of the Gates Reading Survey for the purpose of determining reading rate and comprehension level. On the basis of an operational classification on these two variables, high or low comprehension in combination with fast or slow speeds, subjects were presented with materials of two levels of difficulty (2nd and 6th grade) to either read in Braille or listen to on pre-recorded tapes. Subject factors of CA and IQ were examined in terms of the operationally classified groups.

Results: IQ significantly influences how fast a child reads and how well he comprehends. There are no differences in age between high and low comprehenders or fast and slow readers in this sample, but when the two are taken in combination, dichotomized groups differ with respect to age. This reflects IQ differences. Older, brighter children read faster and comprehend more than their younger, less intelligent counter parts. Older, brighter children in the sample were able to comprehend at a higher level when reading Braille than when listening. On the other hand, those youngsters who comprehend Braille at a low level, probably due to inadequate mastery of the code--and those who read slowly, comprehend more effectively when reading auditorily or listening. In all cases, listening is a more efficient mode in terms of amount learned in time spent. Other studies have shown an efficiency index of at least 100% for various kinds of material. That is, it takes at least twice as long to

read a passage in Braille for the average reader as to listen to it at normal speaking rates of approximately 170 wpm. This limits considerably the amount of material a blind child may be exposed to in the course of his education. It should be pointed out that this does not mean we will stop teaching Braille to children with low IQ's, but we should re-evaluate curricular emphases. Learning to read Braille should have its place in the curriculum for these children, but a broader exposure to curricular content, as opposed to skill building, would be possible by utilizing auditory presentation. The education of the blind child with low mental ability has long presented problems to teachers and supervisors. This is especially true when we are able to broaden our vision to project the needs of these children and all children in terms of effective adult living. We must ask ourselves the question, "What kinds of skills and knowledge must be taught during the school years to accomplish this goal?", and secondly, "What is the most efficient way of accomplishing this end?" It is hoped that this phase of the AFB Listening Research Project will contribute to this decision making. Namely, a de-emphasis of Braille reading as the major source of educational material for low ability children, and a consequent emphasis upon auditory presentation of these materials, so that breadth of exposure to useful information will result.

READING BY LISTENING

Dr. Donovan Foulke

I am interested, primarily, in trying to understand reading systems that depend upon senses other than vision--reading by listening, for instance, or reading by touch. I am interested in trying to understand how the characteristics of these systems determine the performance that is typical of them. There are many ways of approaching problems of this sort, but it seems to me that one useful way is to try to understand what people do when they read by visual examination of a print display, and then to make some comparison between this behavior and the reading behavior that is produced in relation to tactile or aural displays. The objective is to discover just what it is that the people who interact with these displays cannot do and that visual readers can do. The visual display seems to me to have important spatial characteristics, and these characteristics determine, to some extent, the way in which the display can be processed. The tactile and aural reading displays do not have these characteristics, and readers must therefore behave differently in relation to them.

Today, I am going to consider specifically reading by listening. When I talk about reading by listening, I am not talking about conversational speech. I am not talking about an interchange of remarks between two people. I am talking about a straightforward reading system in which the display is the output of a trained oral reader, such as the trained oral readers who record the books for the Library of Congress that are distributed to blind children and adults. The information in the aural display is distributed in a temporal dimension, as opposed to a spatial array. The only information in the display that is directly available to the listener is the information contained in the acoustical pattern that affects his auditory perceptual system at any given instant. It is true that he has a memorial record of what he has heard previously, but I am suggesting that the memorial record may not always be as accurate a record as the immediately available display that continuously confronts the visual reader. This, then,is one of the factors that would have to be taken into account in comparing reading by listening to reading by visual examination of a printed page.

I am supposing that as a person reads, he forms expectancies regarding what is going to come next. At least you can get him to behave as if he did. To test these expectancies, he performs operations that have the function of confirming or disconfirming. This is the point at which, in my opinion, an important divergence takes place. In the case of the person who is reading by listening, if he confirms, he probably continues to read just as the visual reader does, but if he fails to confirm, he does not have at his disposal the same operation that is available to the visual reader. He can attempt to reprocess

whatever is available to his memory, but what is available is not likely to be as complete or accurate as the information printed on the page that is regarded by the visual reader. He is apt to encounter problems not encountered by the visual reader when he is forced, by virtue of having failed to confirm, to search his memory in order to formulate a more accurate notion of the material just heard.

The visual reader can look back, but the aural reader cannot listen back. When the visual reader looks back, another important difference between the two kinds of reading is introduced. The visual reader is able to vary continuously the rate at which he processes his display in accordance with the confirmability of what he is reading. If what he is reading is consistently confirmable, or is otherwise redundant, he is able to read along at a fast and probably fairly steady rate. On the other hand, if, because of the nature of the material, because of its syntactical structure or meaning, he finds himself disconfirming frequently, and is therefore required to look back and reprocess the display more carefully, he is varying the overall rate at which he processes his display. This variation in the rate at which the display is processed is characteristic of visual reading and occurs more or less continuously. The person who is reading by listening cannot do this.

A very complicated sentence, of the sort that one might find in scientific German writing, would be an example of the kind of sentence that might cause a good deal less difficulty when read visually than when listened to. I imagine that it would also cause difficulty when read visually but, at least, when the visual reader begins to be confused, he can look back--he can retrace. If this sentence occurred in a sequence of sentences in connected discourse, presented aurally, the listener would not be able to perform the retracing operation. He might therefore miss all, or a large part of the sentence.

Another major problem with the aural display is the rate at which it can be processed by the reader. It is presented to him at a faster rate than the rate at which he can process a Braille display, in most cases. I know some exceptionally fast Braille readers, but generally speaking, the aural presentation of a trained oral reader is a good deal faster. It will occur at a rate of approximately 175 words per minute, plus or minus a few words, depending upon a lot of factors which I will not go into at present. Let me just offer 175 words per minute as a reasonable estimate of the rate at which a trained oral reader would speak. But the important point is that the person who reads by listening not only reads at a rate that is much slower than the 250 or 300 words per minute that is average for a silent visual reader, but he reads at a rate that is set for him by the rate at which his oral reader happens to speak.

The speaking rate of the oral reader cannot be controlled and continuously varied by the listener in the way the visual reader can vary his rate. However, one of the things you might want to do about the

oral reader's production is to increase the rate at which words occur, so that the listener could read faster. There are now methods by which this can be accomplished. I am not going to spend much time trying to describe these methods, but let me just say that either by an electromechanical sampling method, or by means of a computer, it is possible to increase the word rate of recorded speech without altering the pitch or voice quality of the speaker. The word rate can be increased by any desired amount.

I have been studying accelerated speech for quite some time, and I have found that when word rate is unselectively accelerated, listening comprehension is not seriously affected until a word rate in the neighborhood of 275 words per minute is passed. Thereafter, however, it falls off very rapidly.

An interesting fact in this regard is that, at the point at which listening comprehension begins to fall off rapidly, word intelligibility is still quite high and remains quite high at much greater compressions in time than the compression needed to produce the word rate at which listening comprehension begins to decline. This fact suggests to me that it is not so much the loss in word intelligibility that accounts for the decline in listening comprehension, but perhaps the fact that the individual no longer has the time, distributed throughout the conventional aural display, that he needs to process the material to which he is listening. He is receiving words at a rate that exceeds his processing rate, with the result that there is a rapid decline in listening comprehension.

In research now underway, I am subjecting each word in a listening selection to a fairly large compression and then systematically varying the time between words in order to determine its contribution to the comprehensibility of the listening selection. Next, I will be interested in compressing larger units, such as phrases, which may be the units a visual reader deals with, and then reinserting processing time at the boundaries of these units. The idea here would be to do the organization for the listener that the visual reader can accomplish for himself. This is, of course, partly done by the vocal inflection of the oral reader. But I am suggesting that the heard message might be further organized by introducting time in which to process at the boundaries of phrases, or whatever syntactical units the reader contends with.

Using spoken digits, Aaronson has demonstrated the need for processing time. She used time compression to equate the temporal value of spoken digits. She then systematically varied the amount of time between the spoken digits. She found that when the time between digits was short, people made more errors in recalling the digits than when they were given more time between digits. These results suggest to me that you might find the same effect if you treat connected discourse in the same way. But, I suspect that you might get even better results if you organize connected discourse into phrase-size chunks, rather than word-size chunks.

The normal aural reading rate is approximately 175 words per minute. If you subject recorded speech to mechanical acceleration, you can accelerate to about 275 words per minute without serious loss in comprehension. If you compress single words, you can reproduce a word in as little as 15 per cent of the original production time, and 90 per cent of a list of such words will be identified correctly. If you reproduce each of the words in a list of words in 60 per cent of its original production time, perhaps 85 or 90 per cent of the words in that list will be correctly identified.

Many people have reasoned, incorrectly, that if individual words remain quite intelligible when compressed to 60 per cent of their original durations, connected discourse should be comprehensible when reproduced in 60 per cent of the original production time, but it isn't. The word rate of connected discourse, read originally at 175 words per minute and compressed to 60 per cent of its original production time, would be 437.5 words per minute. Unfamiliar material, read for the first time at this word rate, is almost completely incomprehensible.

In summation, I have said that because of the nature of the aural display, it cannot be processed in the way visual display is processed, to the detriment of the aural reader. I have suggested a few steps that might be taken to counteract this problem. First, you might increase the rate at which the words in the aural display occur. Secondly, you might try to build more organization into the display in order to help the listener process it. I guess my third recommendation would be the design of a tape recorder that has been optimized for reading by listening. The operation required to back this tape recorder up, or to put it into the fast forward mode, should be a very simple one, such as pushing a button. Provision should also be made for scanning recorded tape at high speed, in order to pick up various kinds of indexing or format information that is readily available from the print page display. I am referring here to paragraphs, paragraph headings, chapter headings, page numbers, and so forth.

One thing that the visual reader of a book often does is to scan until he finds those parts that are really of interest to him. When I question people closely who report that they have read a book, I find they often mean that they have skimmed through most of the book, and have read more carefully a few sections in which they are especially interested. This is an important kind of reading for many people, such as the person who must keep abreast with a large and rapidly growing body of professional literature, and perhaps a convenient indexing system could give this capability to the aural reader as well. The comprehensibility of some books might be improved if the oral reader were to read their sections in a different order than the order in which they are printed, but it is what the visual reader does for himself, because he can find his way around the book, that makes his reading an efficient process. He can look at the format and look at the summaries, if he wants to read them first. The aural reader should be able to do this, too. It should not be necessary to require the aural reader or the oral reader to rewrite the book before he reads it.

CONTINUING USE OF OLDER PRACTICES

Beverley Bryan

When educational programs for visually handicapped children were started there was no body of knowledge, but since research, upon which the teachers could draw. They had to apply what they knew about teaching children without visual problems and make adaptations as best they could to meet the needs of the visually handicapped pupils. From the vantage point of the present we may smile over some of the approaches taken, but when we stop to evaluate what was really done in those days we find much of it still basically sound and that many of our present day concepts and procedures are based on exactly the same practices and procedures that were used a long time ago.

Let us recall, for example, that in work for the partially seeing, the medical profession told us that vision could be harmed by too much use. We, therefore, planned with extreme care for periods of eye rest between periods of close eye work. Later, we learned that vision is not harmed through use. We realize, even so, that prolonged periods of close eye work for a partially seeing child result in a shortening of the attention span and in fatigue. Indeed, this is true to a certain extent with a normally seeing child. After prolonged periods of close eye work incidences of behavior problems are noted, more errors in work are found, and there is a lessening of interest in the task at hand. The wise teacher, therefore, will still vary the kind of task assigned and think in terms of frequent change of eye focus in the work involved.

In the beginning it was not considered necessary to have well lighted rooms with color and attractive visual surroundings for the blind children, but from the time programs for partially seeing children started this was stressed. It did not take too long then for educators to realize that in programs for blind children this would be helpful since many of these children had residual vision that could be used to advantage. This meant that teachers of both blind and partially seeing children needed to have information about good lighting, shade control, colors that did not absorb light and/or distract attention, the effect of patterned floors and walls on certain types of eye conditions, and what caused glare.

In recent years new schools have put much emphasis on light and color, and the teacher education programs for visually handicapped have been prone to place less time and effort on the subject of good visual environment, taking it for granted that all schools are now providing this and that all teachers learn about it in their training to work with any children. This is a false premise. Lots of light do not necessarily good light. It still needs to be well diffused and

without glare. Possibly we no longer need to go about a room holding readings with a light meter to be sure that there is the minimum level of required illumination, but we do need to know that the child has the amount of illumination that he needs for the seeing task. This is not guess work but something that the teacher should learn how to judge.

Two, she should apply her knowledge of the amount of light needed for a particular type of eye condition. If a teacher has not been taught anything about glare she cannot be expected to know how to avoid it and make adjustments in the room where her pupil works. Rooms are not yet so perfectly planned and decorated that the teacher will not have to adjust the environment for eye comfort. This may mean no more than proper shade adjustment in some cases. In others it may mean needing to cover glare areas in pictures, clock faces, cupboards, etc.; it may mean inventing a means for covering the chalkboard when it is not in use. (One old tried and true way used to be to place a buff window shade at the top of the board so that it could be pulled down to cover the board. Needless to say, the smart teacher used this for a map, chart, or other illustrative material so that it served a dual purpose.) With a patterned floor a teacher may find that at least part of it can be covered with a plain solid colored rug. Too many school architects have dropped window ledges so low in classrooms that light is reflected up into a child's line of vision as he sits at his desk. The teacher is unfortunate as to work in such a room needs to arrange furniture to block this light if possible. A low bookcase may be set to do this, sometimes an easel may do the job but, also, there are times when nothing of this sort helps. Maybe art work can be placed on the lower part of the windows although it certainly will not be seen to advantage. Any number of other tricks of the trade learned in the adjustment of the environment can be tried.

As one visits schools of the present day it is immediately noticeable that very little thought is given to vision in the seating arrangements in classrooms. Groupings are good but not when some children are placed so that they face into the light and others where they must work in their own shadows or that of the child next to them. This is hard for a normally seeing person, but it places an additional hardship on one with limited vision, even vision limited to just light perception.

For many years the eye center, that was a required part of teacher education for the visually handicapped, related the medical information closely to the educational needs of individual children. It would not have been necessary for example, to note in a talk such as this, the need to assess which children need a great amount of proper light and which function far better with less light. To my mind it is still important for a teacher to know the eye condition of each child for whom she must plan and know the educational implications

resulting from it. Of course she cannot generalize and assume that simply because a child has a certain eye problem and/or a certain acuity he will do thus or so, but at least she will know the possibilities of what she may and may not be able to do and plan accordingly. A teacher without knowledge of the types of eye conditions found in a school age population of visually handicapped children cannot hope to have so much understanding of the individual differences of the pupils with whom she must work as if she knew how and why they see as they do. Just as in the past, the teacher needs to "tailor make" a program for each child based on his needs, one of which is his particular eye condition. At times, just as in the past, she will need to guide and counsel with him and here, again, she will be more adequate for this job if she has a knowledge of his eye problem along with other information about him.

As true as in the past is the fact that a teacher must take into consideration a lot of background information about an individual child before she can plan a program that will meet his particular needs. She knows that no two children are going to need exactly the same kinds of help and that the more she knows about each, the more successful she is going to be in working out the right sort of program for each. This was true in the early days even when there were few resources upon which a teacher could call to obtain such information. She then had to depend for more on her own initiative and, of course, this was one reason that she made a point of learning as much as possible about the child's family and home situation. Among other things, this gave her facts about his experiential background and readiness for school work. It gave her clues as to his attitude about himself and his visual loss. From this she could tell something of the family attitude toward his loss, whether he was overprotected, rejected, how much independence he had developed, and a host of ideas as to his strengths and weaknesses. She also studied his ocular report carefully so that she would have some idea of the amount of sight he had, if any, and could approach the problem of helping him develop the use of what remained. From her knowledge of the probable reaction of a child with a certain kind of eye problem, she could hope at least to anticipate some of his needs and find ways to meet them. She, too, seldom had access to information derived from psychological testing and even later when at least some of this did become available she realized that she could use it only as an indication, not as an established fact about the child. There were too few tests standardized for the blind and none for the partially seeing. Also, there were few psychologists who had had enough experience working with visually handicapped children to have a teacher feel secure in results of testing. She, therefore, garnered all of the information possible in advance, planned a program so that she could determine the child's present situation, and left it flexible so that changes could be made as needs arose.

Even though classes were organized so that the special teacher was usually solely responsible for planning the child's educational program, an attempt was made in the day schools to have the child participate some in the regular classrooms with their seeing peers. The special teacher had to gain the cooperation of classroom teachers if this was to succeed. This is still as necessary as ever even though organizational plans have changed. Now, just as then, the special teacher needs to "go the extra mile", she needs to interpret the child's visual problem to the classroom teacher and help her understand where he may need to vary from the procedure followed by the other children in the group. She needs to give the classroom teacher support and assurance that she will pick up where needed to help the child progress as he should in the classroom setting. She must have the same tactful and cooperative attitude that has always made the difference between the success or failure of a program.

From the beginning, the special teacher has known that a part of her work should be participation in the total school program. She should carry her share of extra-curricular activities and regular faculty assignments. She should recognize that this helps open doors for the visually handicapped to be able to participate in all phases of the school program.

A part of the special teacher's cooperation with classroom teachers has always been a sharing of help and materials. It still is, and while there have been occasions when certain items could not be sent to a regular classroom without depriving a pupil of the use of them, on the whole the special teacher is able to plan so that a regular classroom has access to their use, too.

The smart teacher learned very early that one way to cooperate and gain the good will of the classroom teacher was at times to include sighted children in her teaching. This served the dual purpose of creating good will and of also helping the visually handicapped child learn to work and associate and even compete with the child who had no visual problem. Often in teaching a reading lesson or any other subject to a visually handicapped child, she could include a few children from the regular class who were experiencing trouble in keeping up with the class so needed some extra help and individualized attention. This still proves helpful, be the program organized as a resource or itinerant teacher one.

The teacher also learned early that until a child had a certain amount of background he was not ready for learning. She discovered that the more he could be with his normally seeing peers, the more he developed readiness. This was particularly true if she were working with him individually to give him some preparation for such participation. This meant that she needed to stay currently informed as to what was going on in the regular classrooms. She found, just as the teacher today does, that some children could not tolerate this sort of participation in a large group and that at times the group could not be expected to accept them. In these cases, she kept the child with her and worked intensively with him to bring him to a stage of acceptance, if at all possible.

Even before the day of guidance counselors, school social workers and school psychologists she drew upon any school personnel possible to help her in her work with the pupil to help him develop an acceptable attitude and social behavior pattern. Today she will make referral to the proper school personnel for this sort of help, but she still needs to give that person as much background information as possible before he sees the child and in the proper manner reinforce what is done. Often she still is the one who can do the most to help the child learn how to accept assistance when it is needed. Without her guidance he may not recognize when he does need help. We still must remember that a child who does not see or does not see well may not recognize his limitations and where he can and cannot be independent. Part of the teacher's job is to help him face realistically that he must find ways to work around his visual problem and that when he does, he can make the progress that he should.

From the beginning, teachers have recognized that the child's physical fitness was important. They have been concerned with correct posture, that is so often a big problem with visually handicapped children, and with the need for physical exercise. Such children had very little participation in the organized school gymnasium classes and the special teacher had to compensate for this by conducting physical exercises, taking the children to the recess grounds for games that they could play, etc. On the whole this area of work in day schools was not as strong as it should be. Even today these children do not have as full participation as they should in most instances, and it would behoove the special teacher to continue to do what she can in bringing to them a chance for exercise and recreation. At certain age levels, for example, they still enjoy formal physical exercises done in unison and often to music; they like to march, run relay races, compete in games, and practice jumping. Certainly with young children there is a need to help them learn to run, to hop, to skip, and jump, even more than with normally seeing children. These children should have adjustable seats and desks that will encourage good seating posture. More attention was paid to this for partially seeing than for blind children in programs some years ago. Care was taken to see that the seat permitted the child to sit with feet touching the floor both at the typing table and at his desk. He was not permitted to work without his desk top raised since the raised top prevented hunching over his work as well as working in his own shadow.

Even before training was available for teachers to learn how to teach pre-orientation and mobility skills and before orientation and mobility specialists were available, teachers of blind children recognized that a child had to be taught how to move about and manage for himself. They knew that he had to learn how to orient himself if he were to gain independence. Even though not on as skilled a basis as it is now, such work was done with children. Unfortunately, it was rare to find this attention given to the child who still used sight. This is still woefully lacking for most partially seeing children, many of whom need it so badly.

As mentioned earlier, good classroom environment is most important. Admittedly, the child will not have this in all situations in life but while in school and for at least the part of his work done with the special teacher it should be provided and in the regular classroom he should be located in the area best suited for him to function to advantage.

Walls still should have a matte finish in a pastel shade that will not absorb light. Teachers in the early days learned about choice of color and finish and such information is still important in guiding those responsible for preparation of the room to be used by visually handicapped children. Room location that permits easy access to classrooms and areas of the school used by these children are still factors for consideration in choosing a room for the use of these children.

An important phase of work with visually handicapped children continues to be the choice of proper materials and equipment for the individual child. He must have this for use at home, in the classroom, and in the room where he works with the special teacher, be it a resource room or study area provided for work with an itinerant teacher. At times the emphasis placed on proper equipment has led to erroneous thinking about partially seeing children. Too often we have found people going on the assumption that given the right kind of materials the partially seeing child needs no additional help to progress in school. Anyone, who understands the problems faced by a partially seeing child, knows how false such a premise is. They also know, however, that proper materials and equipment are important and necessary, just as they know that materials presented and available in the room where the children work can add immeasurably to their ability to make the right kind of progress.

Even though we now know that all partially seeing children do not need large type and; indeed, some do better with regular print, there are still a number who must have it. The special teacher needs to understand what constitutes clear readable type and how to evaluate printed material that will ease the seeing task for the partially seeing children, just as much as did those teachers of years past. Time was when a light buff paper was considered best for books and writing paper for partially seeing children. Gradually, this idea changed and many books were printed on white paper since it was felt that the contrast would be better. This has worked well for some of the children but not for all. For those who are bothered by too much light the white paper adds to their problems in reading. There are still times that we must consider the good of all when choices must be made even though we do try to meet the individual needs of children. Probably we should reconsider the matter of acceptance of books using white paper. Fortunately, adherance to use of paper with a dull finish has continued. Unfortunately, less attention seems to be paid to the opacity of paper and we see many books now in use where the print from one side of the page shows

through on the other side so that the child does not have a clear cut print to read. Need for a wide variety of texts and supplementary material has resulted in the acceptance of poor quality books far too often. The idea that something is better than nothing has been carried so far in some instances that instead of furnishing the child with helpful material we add another handicap to his poor vision by asking him to read things that are of the poorest sort of quality. Maybe we need to stop and think through whether or not having it in large type is the important factor. If the paper is thin and glossy so that the print shows through, if the print itself is fuzzy and the illustrations impossible to use, is it really going to be of help to the child? Would it be better to read material aloud, have someone else read it to him, or put it on tape? We recognize that sub standard material may have to be used at times but the teacher still needs to know just what the teacher of earlier days did about evaluating the desirability of the material she gives the child to use, and she should still strive to provide quality materials for him. If she continues to keep in mind the standards for quality material, she will have more success in selection of books on the commercial market that can be used for supplementary and recreational reading. She will consider such things as the type face, spacing between words, letters and lines, margins, and the clearness of illustrations as well as those things previously mentioned about paper.

Early large type books had few, if any, illustrations and teachers spent much time compensating for this lack. Many of the things they did can still be done to the advantage of the partially seeing children with whom they work. Picture files were made with illustrative materials gathered from magazines, calendars, posters and every source that could be found. Care was taken to locate clear pictures with as little background clutter as possible. Often the central part of the picture would be cut out and mounted to make it easier to see and understand. Many had the main parts outlined with India ink and a broad line pen so that they stood out from the background. The pictures were filed in a way that made it easy for the teacher to locate quickly and easily those needed at a given time. Often this was by subject matter category, but there could be any number of break downs depending on the age and grade range of the children who would need them. Such material, incidentally, can be shared to advantage with a classroom teacher

Teachers used to assemble a map file similar to the picture file. Goodness knows this would still be helpful for many children. Frequent request is made to the Printing House for outline maps. A limited number are available but when they are not, a teacher can make her own just as teachers used to do. Often these included maps where colored construction paper was cut and pasted together to give contrast between states or countries or to illustrate other things.

Here, again, the teacher resorted to India ink and a broad line pen to mark whatever was important on the particular map. She was careful to not include too much detail on any one map. She used a series of maps to avoid detail on any one. Even though most present day teachers do far less preparation of material than those of the past, they still can assemble such things as map and picture files by giving guidance to volunteers who would like to be of service.

Paper for writing and typing is more easily available now than in the past. For a long time it was felt that all paper used by the partially seeing children should be similar to that used in the large type books. This is still good for many children, particularly those already mentioned who are bothered by too much light. The wise teacher now will consider, just as in the past, the boldness of the lines on ruled paper. For an astigmatic child, for example, heavy lines are most distracting and make the paper difficult to use. For this reason, one may need paper of different degrees of boldness in the ruling. Many early day teachers found that some of their pupils could use unruled paper to better advantage than the ruled paper and devised occasional guide lines on it to help the child keep his writing "on an even keel".

Fewer tactile aids were used in the education of partially seeing children than in that of blind children in the early days but from the beginning of educational programs these were chosen with care. Here, again, the teacher had limited access to such items and so had to devise them herself. When she did find some she had to evaluate them carefully to be sure that they were of a material that would not cause too much glare. She put great stress on glare knowing that it could cause such visual discomfort that no matter how good the article appeared to be otherwise, it would be rejected by the partially seeing child. There were times when she could reduce or minimize the "shine" by sanding the article, using a sparing amount of paint remover on it, or by some other means. Such things still can be done with some items now on the market, but the teacher now will have to determine the material used to know whether or not it can be treated in such a manner.

When programs were first opened there were only black chalk boards, but for a long time now schools have used a variety of boards, the most commonly seen being some variety of a green one. From the beginning there has been concern over the amount of light absorbed by a black board, so the green ones looked as if they were going to be far more desirable. They can be very acceptable if they are dark enough to give contrast between the board and the chalk marks and are properly cleaned. Alas, most such boards are not kept clean and in time become a gray, unacceptable sort of excuse for a chalk board on which it is all but impossible to see anything. Teachers should continue to give great attention to the board contrast and not use a board when it makes the seeing task harder for the child. It was recommended very early to work with partially seeing children that a

soft white chalk be used on the chalk boards since it gave good contrast and made a wide, rather heavy line. It has always created problems of dust and smearing of the board but is still more satisfactory than any other kind of chalk. Yellow chalk was never recommended by leaders in the field, but some smart dealer called it sight saving chalk and it became widely used for a long time. Those who had had training in work with partially seeing in the early days knew that yellow creates an after image making it undesirable.

Bulletin boards have always been used to advantage in rooms for visually handicapped children. These are not only for decorative purposes but for learning as well. This means that care has been given in placing them properly to enable the child to really make use of materials presented on it.

In discussing posture earlier, reference was made to desks for partially seeing children that were adjustable and had slant tops. It was considered essential to provide desks with tops that would adjust by degrees up to a 90 degree angle. Children were required to use them in a raised position for reading and much of the other work which they did. Unfortunately, school furniture manufacturers no longer make such desk even though they are needed. After these had been discontinued there was one desk on the market that had a top that would raise and this was used in many of the programs. It did not give the desired results since the top would not raise high enough. Also, from early days teachers had children use book racks to hold the books at the right angle when they were reading at a table, in the library or in a regular classroom. Such racks are still on the market and there is even a desk size reading rack that is portable and can be carried from one place to another. Teachers should encourage the use of such items. Copy stands that can double for reading racks have been available for many years and are helpful when typing material must be copied. The ones that stand to one side of the typewriter and have an adjustable arm that swings the material in front of the child, as close or far from him as need be for his ease of seeing, should be used. Separate stands are far better than the type fastened to the typing table since they do not pick up the vibration caused by using the typewriter. When the copy holder is on the typing table and moves as typing is done, it means that the printed material which the child must watch is in motion and, therefore, harder to see.

A teacher of visually handicapped children must work with a number of children at different grade levels who need individual attention. She learned in the beginning that it helped when she could combine [illegible] teaching more than one subject at a time, that she must have materials ready in advance and be able to cope with more than one thing at a time. She found that much incidental learning could be added for the children to reinforce what she and the classroom teacher taught if she took advantage of all opportunities. For example, she would have an interest center in the room where children could work. The items displayed there for the children to examine, and often use, were chosen

to catch the interest of children at varying ages and grade levels. Often she would work out games that could be played independently, or by a few children, so that they gained information and could check the correctness of what they answered or did. There would be sets of different games for different age children but all centered around the same exhibit. This worked equally well with material on the bulletin board. Possibly there would be two pockets attached to a corner of the board with questions and answers dealing with the articles displayed on the board. They could be factual, imaginative, help with improving math, spelling or reading but probably would be a combination of all. Interest centers and bulletin boards were changed often enough for the children to maintain an interest and not become bored with them. They were varied enough to not appear the same each time so that children went to them eagerly to find out what was new. Many of these things could be used for sharing with a regular class.

Typing still needs to be taught early so the visually handicapped child has a way to prepare work in a neat and orderly manner. Regular typing lessons designed for commercial classes are not satisfactory for the young child, so in the early days a simplified plan was worked out for the use of the teacher. She still needs to teach typing and check carefully and regularly to be sure that the child is using the touch system correctly.

The partially seeing child began writing by learning manuscript and moved from this into a simplified form of cursive writing. Attention was called to the formation of letters in the teacher education courses and explanation given as to why the simplified form was used. These letters avoided sharp angles and unnecessary lines. It is acceptable looking but not very different from manuscript. For most of the children it is far easier to read than other types of cursive writing.

Even though the term "listening skills" was not used in the past, teachers spent much time in developing them. They learned to be more verbal in their teaching and encouraged classroom teachers to do the same. They became more descriptive in their talk and held many oral work sessions. Children were taught to take notes as they listened to material read by the teacher. There were frequent stops for discussion of what had been heard. On nature walks and other outings children would listen for certain sounds and later report on them.

Books were scarce, compared with the present time, and there were no recording devices for the classroom so there were times when material had to be read aloud. This meant that the child had no record of it unless some plan was devised. By the time the child reached the fifth grade he learned to make an outline from which he could later study. In some subject areas the teacher made outlines to accompany her reading. Each child had a loose leaf notebook in which he kept such material. Often she made and gave out maps, diagrams, and other kinds of illustrative material to be kept in the notebook for later reference as well as for use at the time the lesson was given. Such ideas can still be useful and help the child develop the ability to take notes

and organize his thinking about what he hears. It stands him in good stead during his college years.

In more recent years we have heard frequently that methods and techniques for teaching partially seeing children are not different from those used for normally seeing; that all they need is large type texts at times and a few pieces of equipment. Of course, methods and techniques on the whole are the same. Fundamental good teaching methods are broad and can be used in any teaching. The important thing in working with partially seeing children is knowing when and where to vary the approach. It is more a matter of stress and an alertness to the need for variation to help the child with the seeing task than it is of methods used in teaching. It has long been said that what is good for the partially seeing child is equally good for the normally seeing one. From years of observation we know that the regular school program often improves after a program for partially seeing children is introduced into the school. Even so, the classroom teacher cannot be expected to have a complete understanding of visual needs, varied as they are, and meet those needs as she handles a full class load.

Variations and stresses considered and used by the special teacher in her work with partially seeing children are based on her knowledge and understanding of a number of things. It has been mentioned earlier, for example, that we no longer believe that vision can be harmed by use or that the eye itself tires. We do know, however, that energy is expended in seeing and that the child with poor vision will tire more quickly than his seeing peers when he must perform the same seeing task that they do. We see him begin to slump, to rub his eyes, to wiggle and squirm just as we see a lessening of accuracy in his work when he is required to continue for a long period of time without a change of eye focus. For this reason, the teacher has always known that she should stay alert for indications of lessening of attention and ability to continue a task. She has to know how to combine a variety of learning experiences into one session for him. For example, she would not just teach a spelling lesson. Along with learning to spell words he would also gain such things as practice in typing, in reading silently and giving back orally what he had read, in reading aloud, in arithmetic concepts and/or word problems, in improvement in writing, and in a host of other concepts.

The teacher has always known that the mere reading of words can be a dull and uninteresting chore. The young child or the one needing remedial help needs his concepts amplified so the teacher followed the same pattern often seen used with normally seeing pupils. The child would act out a part, showing through action what the word or group of words implied. Maybe he would walk a line, play leap frog, throw a ball. The teacher often used real "props" to bring a story alive for the child whose concepts and visual image were lacking due to not seeing things clearly or at all.

Even when there were no resource or itinerant teacher programs, the special teacher had to stay aware of what was happening in the regular classroom where the partially seeing child participated in some classroom subjects and activities. She had to anticipate his need for background information if he was to understand the subject and progress with his classmates. She was careful not to teach what was to be presented in the classroom, but she laid the groundwork for it that enabled the child to grasp whatever was being presented, just as the other children did, rather than sit in bewilderment while they learned. If later she found that the child had not completely understood the new material, she would reinforce the concept, not using the same things or the same approach but by introduction of different materials and a one-to-one discussion with him of the subject.

As a part of laying a groundwork of understanding, the good teacher used a number of devices. She presented materials that were a real challenge and interesting enough to entice the child to find out what it was all about and to want to learn more. Sometimes her bulletin boards could do the teaching job for her when planned so that one or more children could look, question, and find answers to the material displayed. She depended on many devices to build background. Games, plays acted out, reading a story to a group and holding discussion, and other approaches were used.

The child whose reading speed was slow due to low vision and who, due to lack of speed and rapid tiring, would lose interest quickly had to be spurred on to greater achievement through his curiosity to learn a little more than more. As he gained understanding and grew more interested in the subject he would stubbornly stick to the job instead of giving up at the first sign of fatigue. Even then, however, the wise teacher knew that he would need a change of pace. She, therefore, planned a variation in his work that enabled him to continue the learning process. Possibly he would read for a while, switch to listening, write some of what he had read or heard, look at clear illustrative material, and have oral discussion of the subject. Granted, this sort of activity goes on in a regular classroom, but is not geared to the need of the low visioned pupil nor timed to be of much help to him. This, then, is another place in which he needs the help of a special teacher.

The special teacher, from the beginning of educational programs for the visually handicapped, realized that she could not limit her thinking to just teaching subject matter. She recognized that she needed to present a wide and varied background of information to these children who were limited in ability to gain it incidentally the way children with normal vision could. An example of this has always been seen in the lack of knowledge that the visually handicapped child has of the working world. Unless he has wise guidance he may be quite unrealistic about it. Teachers used to be cautioned not to limit their own thinking or that of the child by letting his

visual problem block their thinking as to the kind of work he could complete. At the same time, they had to help the child be realistic about the problems he would face in given situations. This, of course, is still true. If the teacher is successful in helping the student develop a realistic attitude and approach he can make the decision and take his chance on what he wants and plans to do. It is his right to make the decision. Hopefully, the teacher will have helped him learn to abide by the consequences of his decision as long as it is possible to do so. Hopefully, win or lose, he will be able to manage his life and maintain a healthy mental attitude.

In the 1963 edition of EDUCATING AND HEALTH OF THE PARTIALLY SEEING CHILD, Mrs. Gettemeyer discussed "The Good School" in the last chapter. She said, "The school of the future will be so constructed and equipped that it will have a maximum of well-controlled natural illumination and system of artificial illumination best suited to the eyes of children and to the work they are expected to do. Classes will be smaller, so that individual as well as group instruction will be possible. Teachers and nurses will be prepared to give the necessary educational and health services. Educational equipment and material will be suited to the needs of the child for whom it is intended. Textbooks will be better printed, and the use of the mechanical devices will decrease the amount of close eye work now required in the great majority of schools." She goes on to say, "If the advances of the future will so greatly lessen the number of partially seeing pupils, present preparation of prospective teachers, nurses, supervisors, and social workers may seem a waste of time and energy. But Utopia cannot be reached at a bound. Unfortunately, just as there are still isolated cases of smallpox, diphtheria, and other dread diseases, so there will be, scattered throughout the United States, a small number of partially seeing children who will need the assistance of those who understand their difficulties and are equipped to help in solving their problems."

Utopia still has not come but, hopefully, we are continuing to move toward it. In the meantime, we must hold fast to those things that we have found really helpful to visually handicapped children and stay alert to the advances in education and related fields which will enable us to be of more help to these children and will bring us closer to Utopia.

Comparisons of Several Approaches for Teaching Braille Reading to Blind Children

Dr. Randall Harley

The present study was undertaken to develop and to field test materials to be used in a larger two-year study to compare six approaches to teaching Braille reading to blind children. Materials in two Braille media - grade 2 and phonemic - were developed and tested along with the traditional grade 2 system in two basal readers using contrasting approaches - analytic and synthetic. The 39 subjects were located in six classes in six residential schools for the blind.

Visual acuity ranged from 20/200 to total blindness and chronological age from five to ten years. Intellectual ability of the subjects, as measured by the Interim Hayes Binet, ranged from mildly retarded to high average, but there was no significant difference in mental age among the 4 groups used in the final analysis. The grade 1 groups were not compared due to possible unreliability of reading scores from one of the groups.

Special books were embossed in grade 1 and phonemic Braille. Special phonemic codes were prepared for use with the analytic and synthetic readers.

Teachers were prepared in a three-day workshop preceding the start of the school program. The experimental materials were introduced to subjects following a readiness program in each group. A daily progress record was kept by each teacher, and periodic reports were made of special problems encountered in the use of the reading materials. Teacher reactions were used in the evaluation of each approach.

Results of the Gilmore Oral Reading Test and the Gilmore Oral Reading Test administered at the end of the academic year indicated that phonemic Braille could be used successfully with these beginning Braille readers. The analytic approach appeared to function more effectively for the phonemic materials than the synthetic approach. The effectiveness of the grade 1 approaches was not adequately measured. A study of longer duration with more subjects and more adequate materials is necessary to make generalizations concerning the efficiency of approaches in Braille reading.

Discussion of a New Test

This is a test of non-verbal auditory discrimination (TENVAD) which is being developed by Dr. Norman A. Buktenica. This test is still in the experimental stage, but I thought it would be of interest to this group even in its present stage of development.

Background: A trend in educational assessment has been toward developing and utilizing procedures which purport to measure one or more of the "process" functions involved in cognitive thought and in language. Such measures have arisen to meet the increased concern of having instruments which can be used to identify children at an early age who have a high prognosis for various school-related learning problems. Early identification of such children makes it possible to intervene before potential problems are manifest.

The TENVAD is being developed in response to this need for instruments which provide valuable early screening functions. It is felt that assessment of one of the processes involved in cognitive development - auditory discrimination - would be one step in providing a description of the child in terms of his learning characteristics. Such a description, when complete, should be translatable into appropriate teaching procedures, etc.

Description: TENVAD is intended to assess auditory discrimination in young children. It is group administered (but can be given individually) and objectively scored. Its non-verbal nature (uses pairs of pure tones) adds stability to its scores across socio-economic and racial lines.

The test consists of 30 pairs of tones, divided equally into five subtests:

1. Pitch -- tone pairs of the same or different frequency.
2. Loudness -- at a constant frequency, pairs are of the same or different decibel value.
3. Rhythm -- rhythm pairs are either the same or different.
4. Duration -- at a constant frequency, pairs are of the same or different length in duration.
5. Timbre -- tone pairs of the same or different quality.

Directions and Scoring: Complete directions are on the tape; however, the test administrator should be certain that each child understands the concepts of "same" and "different" and can mark his answer sheet. The child responds by marking a white circle if the two tones are the same and by marking a black circle if they are different.

A child's score consists of adding the correct responses for each subtest and totaling these scores. His scores can be directly compared to those obtained through the standardization sample (see table below).

Standardization: Children in three school districts in a metropolitan area were followed over a three-year period, first through third grades, to provide standardization data. Middle-class, lower-class white, and lower-class Negro students were used.

Reliability data, based on K-R 20 formula, ranged from .75 - .78 over the three-year period.

Internal validity evidence comes from several sources. A .60 correlation was found between the TEPAD and Wepman's Auditory Discrimination Test for the first year scores. Correlations between TEPAD and the Metropolitan Achievement Test ranged from .47 - .53, correlating the first and third year MAT scores with first year TEPAD scores. Such findings lend support to the use of TEPAD as an early screening device.

EXPECTED RAW SCORES

Test of
Non-Verbal Auditory Discrimination Test

Age	Pitch	Loudness	Rhythm	Duration	Timbre	Score	Total Reliability
6 (N=191)	9	9	9	8	7	33	.73
7 (N=117)	9	9	9	9	9	36	.78
8 (N=104)	9	9	9	9	9	39	.77

PRE-COLLEGE PREPARATIVE PROGRAM

A pre-college preparation program for visually handicapped students has been set up for the summer of 1969 on the campus of Peabody College in cooperation with the Tennessee Department of Public Welfare. This program is designed to give high school graduates, desiring a college education, special preparatory experience that will enable them to become successful in a college program.

Eight students from the State of Tennessee will be housed on the Peabody campus during the two weeks of the summer session. These students will be evaluated for motivation and college ability. They will receive a special program designed to familiarize them with the college environment. Special resource room teachers will help them in methods of study, organizing materials, and utilizing services available on the college campus. A mobility instructor will teach special orientation mobility skills to some of the students. A rehabilitation counselor will conduct a class and also do individual counseling. Special graduate assistants will work with the students on remedial problems and involvement in social activities. Special consultants will be brought to the campus to advise the staff and to consult with the students.

Case studies will be made of each individual student in the program. Evaluations will be made on each student at the end of the program and recommendations given concerning future training programs. A follow-up study will be made in the middle of the 1969-70 academic year to determine progress of the students who go on to regular college programs.

Each student will sign up at Peabody College for a special course in some academic subject. Students in the pre-college program will be encouraged to work independently and do all the work in obtaining the services of readers as they are needed.

An evaluation of the program will be made based on the findings and results of the courses taken at Peabody during the summer and the follow-up study that is made during the academic year. If the program is successful, it will be continued during the summer of 1970.

[redacted]

Vernon L. Johnson

These past three days have been spent in reviewing three aspects of the problem of providing instructional materials for visually handicapped children. It has been a distinct privilege to meet at the American Printing House for this review and concentrated study which should result in improved services for individual children. Information gained here should be of value in developing procedures for selecting, acquiring and utilizing materials for the visually handicapped. Procedures for selection of the proper materials for individual students involved consideration of:

- production--its supply, limitations and some problems.
- current research--with some of the resulting new materials and methods.
- services of the Regional SECME at the University of Kentucky.
- services of [redacted] at the American Printing House for visually handicapped, including the Central Catalog of volunteer produced materials.
- some other commercial sources.

The acquisition of materials, involves ways and means of financing and assistance from volunteers, such as:

- Federal, State and local funds.
- help from civic organizations.
- using local and other volunteer groups or individuals.

While a limited amount of time was spent on this subject, an attempt was made to answer all questions and explain necessary procedures.

The two preceding activities will be worthwhile only if an effective utilization of the material is made. The real "pay-off" is in:

- choosing and adapting the best item for each child in each situation.
- trying to keep a good balance of media for individualized instruction.
- using all resources for maximum results.
- looking ahead for new methods and materials.

We appreciate the wonderful interest and participation of all of you. Of the twenty-two teachers of visually handicapped public employed during the 1968-69 school year, only three were unable to attend this institute. Every school system invited to participate was represented except one.

Many questions have been raised and answered. Hopefully, we have been challenged to raise more questions which, at the moment perhaps, cannot be answered, but which will lead to more investigation and more efforts to improve services. We are gratified for the response and the success of this, our first such institute, and feel that it paves the way for similar studies in the future.

APPENDIX

Teachers	Home City
Mrs. Shannon Bell	Knoxville
Mrs. Fannie Bowne	Chattanooga
Mrs. Joyce Bromley	Knoxville
Mrs. Sandra Campbell	Nashville
Mrs. Dale Dennison	Nashville
Mrs. Nancy Fullerton	Nashville
Mrs. Mary Lee Germann	Chattanooga
Mrs. Josie Upton	Knoxville
Mrs. Barbara Kunisch	Knoxville
Miss Irma Lane	Memphis
Mrs. Elizabeth McCord	Memphis
Mrs. Betty McInnes	Knoxville
Mr. Joe McNulty	Memphis
Mrs. Betty Neal	Knox County
Mrs. Bettie Shaw	Nashville
Miss Peggy Tatum	Memphis
Mr. Lee Williams	Memphis
Mrs. Sukye Wright	Nashville

Administrators	
Mrs. Alma Brown	Chattanooga
Miss Rebecca Campbell (representative)	Claiborne County
Miss Susie Cardwell	Nashville
Mrs. Rebecca Fine	Knoxville
Mrs. Margie Gilliam	Memphis
Mrs. Elizabeth Montague	Memphis
Mr. Sheffield Rogers	Nashville
Mrs. Dorothy Park	Hamilton County
Mrs. Ethel Piper	Knox County
Mr. Terrell Preston	Johnson City
Mrs. Frances Wyatt	Chattanooga

Regional Center Personnel	
Mrs. Elizabeth Adkins	Memphis
Mrs. Mary Jo Baird	Knox County
Miss Nellie Duff	Knoxville
Mr. Terrell Preston	Johnson City

Tennessee State Department of Education, Adult Basic Education	
Mr. Vernon Johnson	Nashville
Mrs. Betty Berry	Nashville
Mr. Glenn Curtis	Jackson
Mrs. Ann Johnson	Johnson City
Mrs. Eugenia Lange	Knoxville
Mrs. Margaret Pearson	Cookeville
Mrs. Delores Price	Knoxville
Miss Mildred Thompson	Nashville